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ABSTRACT

This review focuses on the effects of multiple contacts with respondents on studies of response rates to mail surveys. After screening articles on research criteria, such as the presence of original research and sufficient reporting detail, 28 studies remained of the original 208 identified. The difference in response rate between treatment and control groups (or comparison groups) was calculated for each point in the process, such as initial and followup contacts. In 16 cases, the difference in response rate between treatment and control (or between treatment groups) was increased when a second contact was instituted, In 27 cases, however, it was diminished, and in 7 cases it reversed. Findings tend to be inconclusive, but it can be seen that followups have the potential for confounding the results of experiments aimed at determining the most effective procedures for facilitating response rates in mail surveys. The most consistent finding is that one followup is more likely to decrease the effect of the manipulation than to enhance or reverse it. However, the magnitude of group differences must be considered along with the effect of the additional contact. With the limited number of cases available, it is not possible to draw hard and fast conclusions regarding many of the independent variables studied or other study characteristics. The 28 studies cited in the review are listed. (Contains 22 references.) (SLD)

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Research on Mail Survey Methods:

Potential Confounding of Treatment Effects Due to Followup Contacts

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Research on Mail Survey Methods: Potential Confounding of Treatment Effects Due to Followup Contacts

Previous research studies (Boser, 1990; Cox, Anderson & Fulcher, 1974; Erdos & Regier, 1977; Etzel & Walker, 1974; Futrell & Lamb, 1981; Kephart & Bressler, 1958; Lam, Malaney & Oteri, 1990; Longworth, 1953; Martin, Duncan & Sawyer, 1984; Myers & Haug, 1969; Nichols & Meyer, 1966; Peterson, 1975; Watson, 1965; Wiseman, 1973) and reviews (Boser & Clark, 1996; Bruvold & Comer, 1988; Conant, Smart & Walker, 1990; Fox, Crask, & Kim, 1988; Green & Hutchinson, 1996; Heberlein & Baumgartner, 1978; Kanuk & Berenson, 1975; Linsky, 1975; Yammarino, Skinner & Childers, 1991), have concluded that followup contacts in mail surveys almost invariably result in increasing the response rates in mail surveys. What has not been explored, however, is the impact of followup contacts on the effect of other manipulations in mail survey methods. The use of a split sample approach, where those targeted to receive a mail questionnaire are either systematically or randomly divided into groups (experimental and control, or multiple experimental conditions), to study the effect of different procedures on mail survey response rates is commonplace. A recent review by Boser & Clark (1996) noted that in studies of mail survey variables where response rates were reported for more than one wave or contact, the followup contact(s) in some situations had a differential effect on response rates of the experimental and control groups or on the treatment groups being compared. That review focused on, and was organized around, the treatment variables, so that studies in which response rates for multiple contacts were reported were not examined as a group. The purpose of this study is to focus on the effects of multiple contacts on studies of mail survey methods.

Methods

The following criteria were established for studies to be included in this review:

1. The purpose of the study was to identify variables that facilitate response rates in mail surveys.

2. The study documented one or more original research studies and was not just a review of research reported elsewhere.

3. The study used a split sample approach or an experimentally manipulated variable while other procedures were held constant across groups.

4. Individuals were randomly or systematically assigned to groups.

5. The study was done in the United States with a target population in this country.

6. The response rate for each treatment group was reported.

7. The sample size was provided.

8. The written account of the survey was obtainable through published sources and written in the English language.

9. Studies in which the only manipulation was a comparison of mail surveys with other procedures (phone surveys, personal interviews, disk surveys, etc.) were inadmissible because they did not provide ways to improve mail surveys.

10. Surveys conducted by FAX, disk or E-Mail were not included.

11. Response rates were reported after more than one wave or contact attempt.

The first method used to locate potential articles was through computer searches of four CD-ROM databases: ERIC, PSYCLit, ABI/Inform, and Sociofile. These databases represent the fields most likely to contain research on mail survey procedures: education, psychology, business and marketing, and sociology respectively. ERIC contains listings of published articles and microfiche documents from January 1966 to the present, while PSYCLit and Sociofile began in January 1974, ABI/Inform in January of 1986. The searches were conducted to identify all listings that contained the term "mail survey" or "mail surveys" in combination with "response rate" or "response rates." Some articles were listed in more than one database. A total of 86 articles were found in Sociofile, 125 in ABI/Inform, 125 in PSYCLit, and 175 in ERIC.

Reference lists of previous reviews on this topic were examined to locate additional studies. Current issues of key journals that routinely publish research studies on survey methods were manually examined in an effort to find articles that had not yet been catalogued into the CD-ROM databases.

Abstracts of the citings were examined, and subsequently entire articles were reviewed to determine their fitness for inclusion in the study. While it could be determined on the basis of the abstract alone that many articles did not meet the criteria for inclusion, there were also many that were deleted only after the article itself had been obtained and read. Some articles contained information about more than one study or had more than one manipulated variable within a single study. Some studies had been published in more than one journal.

After screening the abstracts and articles on the first ten criteria, 208 studies were identified. When the final criterion was applied, 28 studies remained. Twenty-five studies provided response rates after the initial mailing and after one followup contact. In addition, ten studies reported response rates after subsequent contacts. Four studies reported response rates after one, two, and three contact attempts, three studies after each of four attempts. Two studies reported response rates after initial mailing and after the second followup; and another reported response rates after the second, third, and fourth followups but not after the initial mailing. For purposes of this paper, the first or initial contact is defined as the first mailing that includes the questionnaire, regardless of whether or not advance notification was implemented. The second contact is the first followup after the mailing of the questionnaire.

The following information was recorded for each study: study identification (author and year of publication), target population, independent variable, sample size, and response rates for each treatment group or condition at each point in time available. The difference in response rate between treatment and control groups (or between comparison groups) was calculated at each point in time; for example, the

difference (d_1) between the response rates of the treatment (t_1) and control (c_1)) groups after initial contact ($t_1 - c_1 = d_1$) and after two contacts (initial and one followup) ($t_2 - c_2 = d_2$).

The effect of the followup contact (fe) on the difference between groups due to the treatment variable was obtained by subtracting the difference between group response rates after the second contact from the group difference before the second contact ($d_1 - d_2 = fe$). The direction of change is indicated as either increasing (I) the group difference, decreasing (D) the difference between groups, or reversing (R) the effect of the independent variable as a result of the followup contact. A followup effect (fe) near zero indicates that response rates of treatment and control groups (or comparison treatment groups) changed approximately the same percentage in response to the followup contact(s), thus the effect of the independent variable was not confounded or impacted by implementing the followup(s).

When response rates were reported after more than one followup, the difference between groups and the followup effect was calculated at each stage. The followup effect was considered to be the change in group differences since the previous followup, not a cumulative effect of all followups that had occurred. For example, the followup effect at d_4 would reflect the change in the difference between groups that occurred between the third contact (d_3) and the fourth contact (d_4), not the change between the initial mailing (d_1) and after the fourth contact (d_4).

Results and Discussion

Table 1 shows the effect of one followup (second contact) on treatment effects for those studies and conditions for which this information was available. In 16 cases, the difference in response rate between treatment and control (or between treatment groups) was increased when a second contact was instituted; in 27 cases, however, it was diminished; and in seven cases it was reversed. A number of variables were investigated. The variables appearing most frequently were incentives and advance contact.

While there was no consistency of findings regarding the impact of a second contact when the independent variable was advance notification, the treatment effect of incentives was reduced when a followup contact was made under all but two conditions, a promised incentive of $50 and a $20 check (James & Bolstein, 1992). Although response rates of non-incentive groups were usually improved more by a second contact than were incentive groups, the response rates still clearly favor the incentive groups after the second contact. In one of the two cases in which the difference between groups increased, the amount of change was less than 1%, leaving a difference of 34%. In the other case, there was little difference between groups originally (2.6%) or after the second contact (6.6%).

The amount of change after a followup contact ranged from less than one percent to a high of 36 percent. In over one third of the cases reported, there was less than 3% change in the difference between group response rates as a result of a second contact effort (see Table 2).

Table 1

Effect of One Followup On Treatment Effects

Variable - Study	Sample	N	d_1	d_2	fe	Condition
Advance Notification						
Erdos & Regier, 1977	Wall St J subscribers	1,200	+4.9%	+4.5%	0.4%D	postcard
Furse et al, 1981	phone customers	907	+1.0%	+9.0%	8.0%I	phone
Kamins, 1989	general public	505	+27.8%	+30.6%	2.8%I	labeled probe foot
			+16.1%	+19.2%	3.1%I	probe foot
			+12.0%	+11.0%	1.0%D	simple foot
			+8.6%	+7.5%	1.1%D	solicitation group
Murphy, Daley & Dalenberg, 1991	freight forwarders	481	+5.8%	+8.1%	2.3%I	postcard
Smith & Hewett, 1972	general public	1,655	+10.0%	+11.3%	1.3%I	letter advance contact
Spry et al., 1989	general public	600	+8.6%	+7.4%	1.2%D	phone
			+4.5%	+5.4%	0.9%I	postcard
Incentives						
Erdos & Regier, 1977	Wall St J subscribers	800	+13.7%	+8.8%	4.9%D	$1 in first mail (vs .25)
Hopkins, Hopkins, & Schon, 1988	librarians		+21.0%	+12.0%	9.0%D	$1
James & Bolstein, 1990	cable subscribers	850	+8.5%	+2.6%	5.9%D	.25
			+8.9%	+6.0%	2.9%D	.50
			+18.6%	+16.2%	2.4%D	$1
			+23.4%	+16.2%	7.2%D	$2
James & Bolstein, 1992	subcontractors	1,200	+20.0%	+15.3%	4.7%D	$1
			+28.0%	+24.0%	4.0%D	$5 cash
			+31.3%	+26.0%	5.3%D	$5 check
			+23.3%	+20.0%	3.3%D	$10 check
			+33.3%	+34.0%	0.7%I	$20 check
			+33.3%	+26.6%	6.7%D	$40 check
			+2.6%	+6.6%	4.0%I	promise of $50
Spry, Hovell, Sallis, Hofstetter, Elder, & Molgaard, 1989	general public	600	+4.6%	+0.3%	4.3%D	lottery
Tedin & Hofstetter, 1982	general public	1,342	+15.0%	+10.0%	5.0%D	.25
Zusman & Duby, 1987	college dropouts	371	+32.5%	+18.9%	13.6%D	$1
Postage						
Corcoran, 1985	social workers	300	+11.3%	+4%	7.3%D	first class stamp (return)
Elkind Tryon & deVito, 1986	psychologists	500	+3.2%	-0.4%	3.6%R	first class stamp (return)
Tedin & Hofstetter, 1982	general public	1,342	+12.0%	+15.0%	3.0%I	certified mail (vs first class)

Table 1. Effect of One Followup On Treatment Effects (continued)

Variable - Study	Sample	N	d_1	d_2	fe	Condition
Personalization						
Andreason, 1970	lottery winners	15	- 10.0%	- 3.7%	6.3%D	typed, pers. salutation (vs mimeo)
			- 3.5%	- 2.7%	0.8%D	typed, pers salutation, postscript (vs mimeo)
			+ 6.5%	+ 1.0%	5.5%D	postscript added
Moore, 1941	superintendents	494	+ 9.5%	+ 16.3%	7.9%I	typed (vs duplicated)
Roberts, McCrory & Forthofer, 1978	dentists	1,190	+ 1.4%	- 0.9%	2.3%R	personal salutation
Questionnaire Format						
Boser, 1990	alumni	300	+ 5.6%	+ 5.9%	0.3%I	booklet (vs. typed 8 1/2 x 11)
Boser, 1990	alumni	297	+ 2.4%	+ 2.5%	0.1%I	booklet
Champion & Sear, 1969	general public	2,290	- 10.9%	- 4.6%	6.3%D	3 pages (vs 6)
			- 11.9%	- 3.1%	8.8%D	3 pages (vs 9)
			- 1.0%	+ 1.5%	2.5%R	6 pages (vs 9)
Jacobs, 1986	teachers	200	- 2.0%	+ 2.0%	4.0%R	use of optical scan sheets
Questionnaire Length						
Brown, 1965	physicians	523	+ 15.0%	+ 1.0%	14.0%D	short (postcard, 2q) vs 1 page
Jacobs, 1986	students	200	- 4.0%	+ 2.0%	6.0%R	short (1 page, 14 items) (vs 2 p, 20 items)
Sponsor						
Erdos & Regier, 1977	Wall Street Journal	400	+ 19.0%	+ 16.0%	3.0%D	familiar sponsor
Taylor, 1987	citrus growers	3,467	+ 16.9%	+ 19.4%	2.5%I	familiar sponsor
Appeal						
Roberts et al., 1978	dentists	1,190	- 3.0%	- 2.6%	0.4%D	social appeal
Sirken Pifer & Brown, 1960	families of decedents	658	- 18.0%	- 13.0%	5.0%D	help the sponsor
Other						
Elkind, Tryon & deVito, 1986	psychologists	500	+ 2.4%	- 2.8%	5.2%R	university envelope (vs rubber stamped)
Hinrichs, 1975	administrators	2,547	- 2.6%	+ 4.0%	6.6%R	with commitment card
McKee, 1992	nonprofit prof. org. members	280	+ 20.0%	+ 22.8%	2.8%I	ID coded & explained
Roberts, McCrory & Forthofer, 1978	dentists	1,190	+ 5.8%	+ 7.3%	1.5%I	deadline stated
Wagner & O'Toole, 1985	psychology dept. heads	106	- 34.0%	- 70.0%	36.0%I	humorous cover letter

Table 2

Change in Treatment Effect After One Followup

Amount of change	n	%
Less than 1% change	7	14
1.0% - 1.9%	5	10
2.0% - 2.9%	8	16
3.0% - 3.9%	5	10
4.0% - 4.9%	5	10
5.0% - 5.9%	6	12
6.0% - 6.9%	5	10
7.0% - 7.9%	3	6
8.0% - 8.9%	2	4
9.0% - 9.9%	1	2
10.0% or more	3	6

When more than one followup contact was made, mixed results were also found, as shown in Tables 3 and 4. In many cases, continued followup contacts further reduce the difference between groups, particularly through the third contact. While some of the differences may have been substantial after the initial contact, in some cases they became negligible (3%) after the third contact. James & Bolstein (1990) found group differences decreased from 8.5% after one contact to 0.5% after the third; Sirken, Pifer & Brown (1960) saw a decrease from 18% to 2%. Others, however, such as Rucker, Hughes, Thompson, Harrison, & Vanderlip (1984) found group differences increased as a result of two additional contacts.

As was true for those cases where information was available after the second contact, over one third of the cases (9 or 24) showed differences between groups of less than 3% after the third contact. In examining the results in regard to particular independent variables, both studies utilizing appeals to promote response (Roberts, McCrory & Forthofer, 1978; Sirken, Pifer & Brown, 1960) found the effects of those appeals virtually eliminated after three contacts, and the two studies investigating personalization (Green & Kvidahl, 1989; Roberts, McCrory & Forthofer, 1978) found little change in group differences.

Table 3

Group Differences After Multiple Followups

Variable - Study	Sample	N	d_1	d_2	d_3	d_4	Condition
Incentives							
James & Bolstein, 1990	cable subscribers	850	+ 8.5%	+ 2.6%	- 0.5%	- 1.7%	.25 incentive
			+ 8.9%	+ 6.0%	- 0.6%	- 1.6%	.50
			+18.6%	+16.2%	+ 8.4%	+ 4.8%	$1.00
			+ 23.4%	+16.2%	+ 11.4%	+ 7.8%	$2.00
James & Bolstein, 1992	subcontractors	1,200	+ 20.0%	+ 15.3%	+ 14.6%	+ 12.0%	$1
			+ 28.0%	+ 24.0%	+ 20.0%	+ 19.3%	$5 cash
			+ 31.3%	+ 26.0%	+ 20.0%	+ 15.3%	$5 check
			+ 23.3%	+ 20.0%	+ 15.3%	+ 14.7%	$10 check
			+ 33.3%	+ 34.0%	+ 28.6%	+ 27.3%	$20 check
			+ 33.3%	+ 26.6%	+ 19.3%	+ 17.3%	$40 check
			+ 2.6%	+ 6.6%	+ 5.6%	+ 4.7%	promise of $50
Sponsor							
Rucker, Hughes, Thompson, Harrison, & Vanderlip, 1984	alumni	384	+ 5.7		+ 0.2%		animal science (vs textiles & clothing)
Rucker et al., 1984	alumni	384	+ 1.6%		+ 0.8%		student (vs professor)
Taylor, 1987	citrus growers	3,467	+ 16.9%	+ 19.4%	+ 17.3%		familiar sponsor
Personalization							
Green & Kvidahl, 1989	teachers	600	+ 10.0%		+ 11.0%		personalized letter, salutation, address, signature
Roberts, McCrory & Forthofer, 1978	dentists	1,190	+ 1.4%	- 0.9%	+ 2.4%		personalized salutation
Appeal							
Roberts et al. 1978	dentists	1,190	- 3.0%	- 2.6%	- 1.4%		social appeal
Sirken, Pifer & Brown, 1960	decedent families	658	- 18.0%	- 13.0%	- 2.0%		help the sponsor
Other							
Anderson, Niebuhr & Gum, 1987	doctors	132		+ 20.0%	+ 13.0%	+ 1.0%	outgoing Fed Ex mail (vs 1st class)
Boser, 1990	alumni	297	+ 2.4%	+ 2.5%	+ 3.2%	- 2.9%	booklet format
Brown, 1965	physicians	523	+ 15.0%	+ 1.0%	0.0%		length - Postcard (vs 1 page)
Roberts et al., 1978	dentists	1,190	+ 5.8%	+ 7.3%	+ 2.6%		deadline stated
Rucker et al., 1984	alumni	384	+ 1.3%		- 16.5%		photo of professionally dressed female on cover letter
			- .2%		- 9.5%		casually dressed female

Table 4

Effect of Multiple Followups

Variable - Study	Sample	N	fe @d_2	fe@d_3	fe@d_4	Condition
<u>Incentives</u>						
James & Bolstein, 1990	cable subscribers	850	5.9%D	3.1%R	1.2%I	.25 incentive
			2.9%D	6.6%R	1.0%I	.50
			2.4%D	7.8%D	3.6%D	$1.00
			7.2%D	4.8%D	3.6%D	$2.00
James & Bolstein, 1992	subcontractors	1,200	4.7%D	0.7%D	2.6%D	$1
			4.0%D	4.0%D	0.7%D	$5 cash
			5.3%D	6.0%D	4.7%D	$5 check
			3.3%D	4.7%D	0.6%D	$10 check
			0.7%I	5.4%D	1.3%D	$20 check
			6.7%D	7.3%D	2.0%D	$40 check
			4.0%I	1.0%D	0.9%D	promise of $50
<u>Sponsor</u>						
Rucker, Hughes, Thompson, Harrison, & Vanderlip, 1984	alumni	384	*	5.5%D		animal science (vs textiles & clothing)
			*			
Rucker et al., 1984	alumni	384		1.6%D		student (vs professor)
Taylor, 1987	citrus growers	3,467	2.5%I	2.1%D		familiar sponsor
<u>Personalization</u>						
Green & Kvidahl, 1989	teachers	600	*	1.0%I		personalized letter, signature, salutation, address,
Roberts, McCrory & Forthofer, 1978	dentists	1,190	2.3%R	3.3%R		personalized salutation
<u>Appeal</u>						
Roberts et al., 1978	dentists	1,190	0.4%D	1.2%D		social appeal
Sirken, Pifer & Brown, 1960	decedent families	658	5.0%D	11.0%D		help the sponsor
<u>Other</u>						
Anderson, Niebuhr & Gum, 1987	doctors	132	**	7.0%D	12.0%D	outgoing Fed Ex mail (vs 1st class)
Boser, 1990	alumni	297	0.1%I	0.7%I	6.1%R	booklet format
Brown, 1965	physicians	523	14.0%D	1.0%D		length - Postcard (vs 1 page)
Roberts et al., 1978	dentists	1,190	1.5%I	4.7%D		deadline stated
Rucker et al., 1984	alumni		*	17.8%R		photo of professionally dressed female on cover letter
			*	9.3%I		casually dressed female

*No response rates reported after d_2 (second followup)

**No response rates reported after initial contact

Regarding the use of incentives, most forms of incentives studied by James & Bolstein (1990,1992) showed consistently less impact on response rates as additional followups were instituted. Exceptions were in the use of a $20 check and the promise of $50, and cash incentives of less than a dollar. Cash incentives of one dollar or more and checks still showed distinct advantages over control groups who did not receive incentives even after the fourth contact.

Some individual studies dealing with a particular independent variable raise particularly interesting questions about the impact of followups. While there was little difference due to the use of photos on the cover letter after the initial mailing (Rucker et al., 1984), those receiving the photo version were characterized by considerably lower response rates than the control group after the third contact . Inconsistent or erratic results were found between contacts in studies concerning familiarity with sponsor (Taylor, 1987), questionnaire format (Boser, 1990), use of a deadline (Roberts et al., 1978), and personalization (Roberts et al., 1978).

Conclusions

While findings tend to be inconclusive, it can be seen that followups have the potential for confounding the results of experiments aimed at determining the most effective procedures for facilitating response rates in mail surveys. The most consistent findings are that one followup was more likely to decrease the effect of the manipulation than to enhance or reverse it, especially the use of incentives. However, the magnitude of group differences must be considered along with the effect of the additional contact(s). In some cases the difference between groups is lessened, but the group response rates are still considerably different, thus the manipulation would still be recommended.

With the limited number of cases available, it is not possible to draw hard and fast conclusions regarding many of the independent variables studied or other study characteristics such as the target population, recency of the study, etc. It is to be strongly recommended that reports dealing with experimental studies regarding mail survey methods be complete in documenting group response rates after each contact so that the reader can fully understand the study and evaluate the findings.

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